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Description of new species of Japanese Heterocera.

BY REV. W. J. HOLLAND, D.D. PH.D.

It was my privilege, in the year 1887, to be invited by my friend, Prof. D. P. Todd, of Amherst College, to accompany the expedition sent by the United States Navy Department and the National Academy of Science, to Japan for the purpose of observing the total eclipse of the sun of that year. As the naturalist of the party I was accorded much courtesy and was enabled to prosecute somewhat widely investigations into the botany and zoology of the islands. The brief space of four months, during which I labored upon Japanese soil, was, however, all too short for satisfactory work, and I regret greatly that I was not able to devote a much longer time to study and research in this most interesting field. Nevertheless the results achieved were not altogether unsatisfactory, and I have the pleasure in the accompanying paper of presenting to the attention of the scientific world descriptions of a few species of Macrolepidoptera, which, so far as I am aware, have not yet been described. I confine myself in this paper mainly to species which, having resolved to name in honor of persons who were members of the U. S. Eclipse Expedition, or who rendered us assistance, I wish, therefore, to appropriate before some other entomologist shall have attached to them a designation.

HETEROCERA.**SPHINGES L.**

Family SPHINGIDÆ Boisd.

Subfamily CHÆROCAMPINÆ Butler.

Genus **ACOSMERYX** Boisd.**1. A. Iyenobu** n. sp.

UPPERSIDE.—Head, thorax and abdomen ferruginous, the head and thorax being redder than the abdomen. A light mouse gray dorsal line runs from the crest to the anal extremity of the abdomen, and a line of the same color passes just over the eyes along the lower edge of the tegulæ. The first and second segments of the abdomen are marked with black spots, the first of which is preceded by a tuft of mouse-gray hairs; the sides of the abdomen are lighter in color than the back. The antennæ are light yellow; the palpi are a shade paler than the head and grayish in color. *Primaries*: the general color of the primaries is gray with a lilac cast, inclining to ferruginous at the base and the costa.

A black spot is situated at the base near the hind margin; two brown curved bands run very obliquely from the costa before the middle toward the inner margin at the base, which they do not quite reach; beyond the middle is a broader and much darker band of the same color, which is parallel to the last named and terminates about the middle of the inner margin; beyond this a narrow sinuous line runs from the costa to the inner margin being shaded externally with pinkish ochreous and osculating on vein 5 with a dark submarginal line, which runs obliquely from the apex to vein 5 and then diverging at an obtuse angle, terminates at the internal angle of the wing. The triangular space enclosed between these two lines at the apex is dark brown; the triangular space included between the submarginal line and the outer margin is lilac-gray. *Secondaries*: base and discal area black, fading into gray on outer margin.

UNDERSIDE.—Palpi whitish, thorax and abdomen pinkish fawn color. *Primaries* and *secondaries* broadly pinkish fawn, the *primaries* shaded with black on disc and with a wide marginal shade of dark gray acutely angled at vein 5; *secondaries* crossed by ferruginous median and submarginal transverse lines, which are in some specimens faintly continued upon the *primaries* also. A broad marginal shade of the same color as on the *primaries* and also acutely angled on vein 5 completes the ornamentation of the *secondaries*. Exp. of wings 85–90 mm.

Type in coll. Holland.

I have given to this species, the first specimen of which I found sitting upon the side of the mortuary chapel of the Sixth Shogun in the Shiba Park at Tokyō, the name of that illustrious prince of the Tokugawa family.

BOMBYCES.

Family LIPARIDÆ Boisd.

Genus **EPICOPEIA** Westw.

2 **E. Hainesii** n. sp.—Allied to *Mencia* Moore (P. Z. S. Lond. 1874, p. 578, plate lxvii, fig. 8).

UPPERSIDE.—Head, thorax, abdomen and antennæ black, without any red markings whatever. *Primaries*, with the outer margin not as convex as in *Mencia*. gray, palest on the outer third, with the outer margin broadly black and the veins black. *Secondaries* deeply excised or concave on the outer margin, the line of curvature being continuous from just below the external angle to the extremity of the broad, somewhat short and very spatulate tail. The basal and discal areas are dark brownish gray, the outer third and the tail deep velvety black, and the veins all black. A crimson lunule appears just below the outer angle near the margin, and there are four crimson lunules extending from the anal angle in a marginal row to the origin of the tail.

UNDERSIDE.—Palpi and thorax black. Legs black, except femora, which are crimson. Abdomen black, with a crimson line running along the sides from the first segment to the last on the line of the spiracles, and the margin of each segment fringed with crimson. *Primaries* throughout light yellowish gray shading into blackish on the disc, the veins being pale brown gray. *Secondaries* exactly as on upper surface, save that the crimson lunules are somewhat larger and more sharply defined. Expanse of wings 62 mm.

Described from a male specimen in coll. Holland given me by Rev. Mr. Haines, of the Doshisha School in Kioto, who received it from Mrs. Gulick, who captured it upon Hi-yei-san, the lovely mountain rising to the Northeast of Kioto upon the boundaries of Yamashiro. I have seen several other specimens of this or a closely allied species taken on the volcano Asama-yama and contained in the collection of Mr. Harry Pryer, of Yokohama (No. 3 in Pryer's Catalogue; Trans. Asiat. Soc. Japan vol. xi, p. 239). As the species inhabits the mountains of the main island at an elevation of 3000 to 4000 feet, it will also very probably occur in Yesso.

Genus **ARTAXA** Walker.

3. **Artaxa Torasan** n. sp.—♂. Uniformly of a bright orange red. The upper surface of the posterior wings slightly clouded on the disc by fuscous. A small dash of obscure brown on the under surface of the primaries behind the costal margin of the apex. Expanse of wings 22 mm.

One ♂, Shirakawa, July. Type in coll. Holland.

I take pleasure in naming this beautiful little insect after my faithful Japanese assistant, Tora-san, of whose unfailing ingenuity and untiring perseverance I retain a most grateful recollection.

NOTODONTIDÆ.

BIRETA Walker.

4. **Bireta Southerlandii** n. sp.—♂. Prevalently pale stramineous, with a shade of pale brown running from the base of the primaries just below the cell and then curving upward to the apex. The upper surface of the secondaries is somewhat darker than that of the primaries. Antennæ heavily pectinated. The female does not differ in coloration from the male. Expanse of wings 40–44 mm.

Types in coll. Holland.

I name this species after Lieut. W. H. H. Southerland, of the United States Navy, who was detailed by Admiral Chandler to act as one of the assistants of the astronomer of the expedition.

Genus **NOTODONTA** Ochs.

5. **Notodonta Toddii** n. sp.

♀. **UPPERSIDE.**—Corselet ashen gray, bordered posteriorly by a line of black, which is continued upon the outer edges of the patagiæ. Thorax dark brown, with a geminate median line. Abdomen light gray. *Anterior wings* gray, inclining to brownish, traversed by a black, transverse, anterior line, greatly curved and denticulated, defined inwardly by pale gray and terminating upon the submedian nervule. The transverse posterior line is of a paler gray than the body of the wing. A reniform spot of the same pale shade is faintly visible.

A broad, blackish, subapical shade extends from a little below the apex on the outer margin to the transverse posterior line at the point where it crosses the third submedian nervule. A still broader and darker shade extends from the base of the wing below the cell terminating upon the outer margin at the second submedian nervule. This shade is darkest on the intra-neural spaces; a small curved dash of black appears near the costa and parallel to it just before the apex. The nerves and nervules, especially near their marginal extremities are defined by black. *Posterior wings* uniformly dull gray with broad margins of a lighter shade, the nervules darker, especially toward their extremities.

UNDERSIDE.—Light ashen gray, with the basal and middle area of the anterior wings darker in color. Both wings have a dark shade crossing the end of the cell and both are crossed by a dark transverse posterior line vanishing before the inner margin is reached. Expanse of wings 62 mm.

Type in coll. Holland.

It is with some hesitation that I refer this fine species to the genus *Notodonta*. The only specimen I have seen is the type, which is a very fresh specimen taken at Yokohama, and another badly damaged example, likewise a female, in the collection of Mr. Pryer. The apparent absence of the tooth-like projection of the wing upon the inner margin of the primaries would indicate the propriety of referring to another genus, but, as this feature is less marked in the male than in the female sex of other species, I have not been willing to run the risk of creating a new genus for the reception of this insect, as I have been urged to do by one or two of my scientific friends who have examined the specimen.

I name the species in honor of Prof. David P. Todd, Director of the Amherst College Observatory.

NOCTUAE.

Genus **RUSINA** Boisd.

6. **Rusina Ripleyi** n. sp.—♂ ♀. Front white, corselet and patagiæ dark gray, bordered with white. Thorax and abdomen lustrous pearly gray.

UPPERSIDE.—*Anterior wings* with an irregular black spot at base bordered externally with whitish, basal area dark gray, transverse anterior and posterior lines irregular, light grayish white, bordered on both sides by a narrow black line. There is a light spot in the cell bordered with black and followed by a dark transverse shade widest on the costa and interrupted by the reniform, which is black circled with light gray. The limbal area is darker gray than the middle area and is traversed by three somewhat parallel and very narrow black lines, the first two of which run obliquely from the direction of the costa toward the outer margin, and the third, which is broken, terminates upon the inner margin before the inner angle. *Posterior wings* light rufous gray, with the outer margins broadly blackish. Fringes whitish, checkered with the dark shade of the margin.

UNDERSIDE.—Body, legs and basal area of wings light yellowish gray, the tibiæ ringed with black. A dark bifid shade appears on the costa of both wings just before the black dot which is found at the end of the cell in both. The margins are broadly dark gray, widest at the costa. The female differs from the male only in the absence of the dense pectination of the antennæ. Expanse of wings 36 mm.

Types in coll. Holland.

I took this species abundantly at sugar at Shirakawa, Fukushima Ken. Mr. Pryer had never seen the species. I name it in honor of a friend who accompanied me upon the evening I took the largest number of specimens, and who has since lost his life in the Yellow Sea by the foundering of the steamer upon which he was going for an excursion to Borneo.

Genus **COSMIA** Ochs.

7. **Cosmia Pembertonii**.—Front, corselet, thorax and abdomen dark vinous brown.

UPPERSIDE.—*Anterior wings* vinous brown, darker upon the basal area; transverse anterior line white, bordered externally by dark brown and running obliquely in an almost straight line from a point on the costa one-third of the distance from the base to the middle of the inner margin; transverse posterior line white, bordered internally by dark brown, followed above the inner margin by a wide and even shade of vinous brown darker than the ground color of the wing. This shade is lost toward the costa in a large subtriangular spot of rich maroon which extends from the costa to near the middle of the wing and is ornamented by a comma-shaped dash of pure white, which is widest on the costa; a small, subtriangular spot of dark brown ornaments the limbal area just before the apex. *Posterior wings* dark testaceous. Fringes lighter, reddish.

UNDERSIDE.—Pinkish gray; the middle of the anterior wings clouded with blackish, darkest towards the outer margin; the white comma-shaped dash of the anterior wing reappears upon the underside, but is faint; the posterior wings have a blackish dot at the end of the cell and are crossed near the outer third by a transverse line, which is darkest on the costa and does not quite extend to the inner margin. Expanse of wings 30 mm.

Type in coll. Holland.

I name this species after P. A. Engineer, J. Pemberton, U. S. N., in recognition of his labors in connection with the Eclipse Expedition.

Hab.—Shirakawa.

Genus **CATOCALA** Schr.

8. **Catocala Mabella** n. sp.

UPPERSIDE.—Head, front, thorax and abdomen, light ashen gray; the corselet is bordered above by a narrow line of dark brown. *Anterior wings* light pearly gray, palest on the middle area near the costa. Reniform whitish, with an annulus of pale gray, bordered with whitish. Subreniform of the ground color of the wing, subquadrate, narrowly margined with black. Basal line black, very narrow and in some specimens almost obsolete; transverse anterior line and

transverse posterior line very narrow, black, distinct, broadest on costa; limbal area traversed by a very faint gray submarginal line clouded on both sides by gray, slightly darker than the ground color of the wing. *Posterior wings* pale yellow, obscured by gray hairs at base and on inner margin. Median band broad, black, thickened and produced at end of cell, submarginal band broad, black, deeply sinuate internally opposite cell and just before the anal angle, the portion at the anal angle in some specimens appearing as a detached spot of black, bifid on inner side. At the external angle on the margin is a yellow spot shading into the fringes, which are broad, pale yellow, clouded with gray at the tips of the nervules.

UNDERSIDE.—Thorax, legs and abdomen whitish. *Anterior wings* of the same color as the body, clouded with gray on basal area, traversed by broad, black, median and submarginal bands, the former produced on vein 6, and the latter deeply sinuate opposite this projection. Margins gray, with a very narrow marginal line. *Posterior wings* of same color as underside of the abdomen shading into light yellow near the inner margin and anal angle. Markings as on the upper surface. Expanse of wings 60 mm.

Oiwake. Type in coll. Holland.

I name this species in honor of Mrs. Mabel Loomis Todd, the accomplished wife of Prof. Todd, whose presence did much to enliven the stay at the old castle of Shirakawa.

Genus **SYPNA** Guén.

9. **Sypna Watanabii** n. sp.

UPPERSIDE.—Prevaillingly wood brown. *Anterior wings* lightest on middle area. Between the basal area, which is marked by a number of minute lines of darker color and the middle area, which is likewise thus ornamented, is a somewhat broad, sharply defined transverse anterior band of maroon margined with deep black and acutely toothed externally near the origin of the first submedian nervule. The transverse posterior line is very narrow, black, irregularly undate and toothed and margined externally by a broad shade of deep brown; a dash of black extends from the t. p. line along the first submedian nervule to the outer margin as a reappearance and prolongation of the tooth-like projection on the t. a. line. There is a subocellate spot of brown at the apex, preceded on the costa by a subquadrate spot of the same color. *Posterior wings* uniformly dark grayish brown, slightly lighter on the basal area.

UNDERSIDE.—Uniformly wood gray, darkest on limbal area; a dark shade at end of cell and a faint median line on both wings. Marginal line narrow and very regularly and beautifully crenulate. Expanse of wings 43 mm.

Hab.—Oiwake. Type in coll. Holland.

This species is represented in my collection by several specimens taken at sugar in August, at Oiwake, upon the flanks of the great volcano Asama-yama. I have seen also several specimens in Mr. Pryer's collection designated neither by number nor name. I take pleasure in naming this little creature in honor of Mr. H. Watanabé, President of the Imperial University at Tokio, to whom I am indebted for distinguished courtesies.